Money Isn't All You're Saving

Improve Indoor Air Quality with Continuous Exhaust Ventilation

Builder Guide

DESCRIPTION

Energy efficient houses today are often built with tight construction practices to reduce energy bills, and improve quality. Tight houses should be equipped with active ventilation to ensure good indoor air quality. Continuous Exhaust (CE) is the least expensive type of active ventilation.

CE ventilation ensures the proper amount of ventilation is provided at all times of the year (see Sizing Table below.) Instead of individual bathroom and kitchen exhaust fans that only run when switched on, a CE ventilation system uses a single centrally located exhaust fan that is ducted to the bathrooms. The fan should be designed for continuous operation and sized to exhaust the quantity of air required by the local building code. Two-speed fans are also available, with a higher speed setting to allow for removal of additional humid air or odors when necessary.

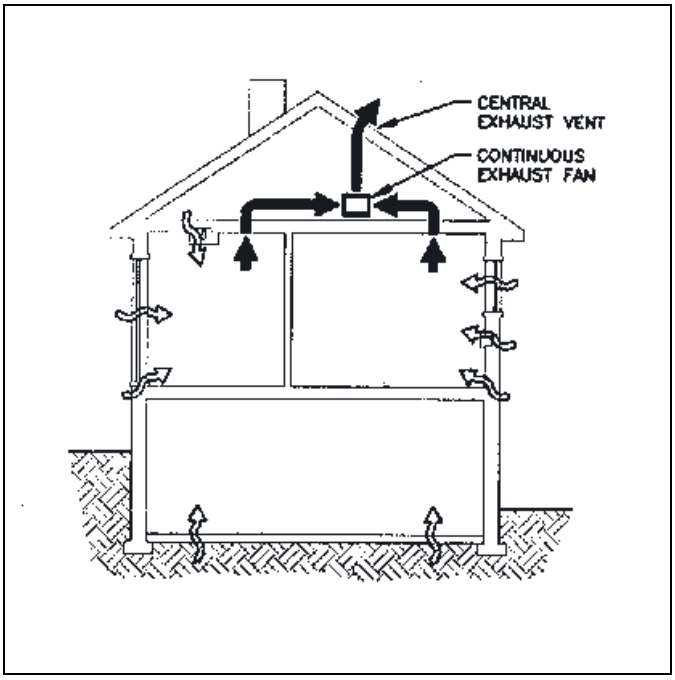
Continuous Exhaust Fan Sizing (cfm)

Prescriptive	Performance
(1+bedrooms) * 15 cfm + (bath*20 cfm)	$\frac{\text{house volume} * 0.35}{60}$

BENEFITS

Builders providing a comfortable, energy efficient house with active ventilation should look for increased customer satisfaction and referrals, and reduced callbacks. This can increase business and profits.

Continuous Exhaust Ventilation



❑ Continuous Exhaust ventilation can often be provided at no additional cost.

CE ventilation systems can often be installed for no or minimal additional cost, compared with a typical house with spot ventilation (individual bathroom fans.) This is possible because a single ducted central fan can replace all of the individual bathroom fans for about the same cost.

❑ Continuous Exhaust ventilation improves health.

Stale air can make people feel sick. It can cause symptoms such as headaches, drowsiness, and respiratory problems. Rather than counting on "accidental" ventilation, which is weather dependent, continuous exhaust ventilation assures occupants receive a continuous flow of healthy fresh air.

❑ Continuous Exhaust ventilation improves comfort.

Fresh air is easier to breathe. A house with a continuous exhaust ventilation system can be more comfortable, because a steady stream of clean fresh air is evenly supplied throughout the house, rather than through drafty leaks.

❑ Continuous Exhaust ventilation reduces odors.

Continuous exhaust ventilation systems continually exhaust stale air and odors, and replace them with fresh outdoor air. This continuous flow of fresh air reduces the possible accumulation of odors and other indoor air pollutants.

INTEGRATION

Proper installation of continuous exhaust ventilation systems requires an integrated team effort by the builder and his subcontractors.

❑ Continuous Exhaust ventilation may be designed with makeup air.

Continuous exhaust may be used alone with properly sized wall intake vents or “trickle ventilator” windows. At a slightly higher cost, a supply fan and make-up-air duct can be installed on the return side of the forced air system. The separate supply system blows only the fresh air required to replace the exhausted air, offering greater control of indoor air quality.

❑ Exhaust Only ventilation systems are incompatible with inefficient combustion heating appliances.

When a fresh air supply duct is not used on a continuous exhaust ventilation system, direct vented (sealed combustion) furnaces and hot-water heaters should be used. If inefficient atmospheric vented heating appliances are installed in the house, negative pressure created by the exhaust fan may be able to back-draft dangerous combustion gases into the home.

❑ Installation requires coordination between contractors.

Installation of active ventilation systems requires coordination between HVAC and electrical contractors. The HVAC contractor usually leads the installation, but electrical contractors may need to be involved as well.

❑ Fresh air intake should be carefully placed to avoid contamination.

If a fresh air intake is positioned near a pollutant source such as a chimney, a vent stack, a dryer vent, or a busy street, the air supply will not be fresh. Careful placement of the fresh air intakeis critical for a properly designed ventilation system.

❑ Exhaust Only ventilation only makes sense if the house is well sealed.

A comprehensive sealing effort is critical to an effective ventilation system. Therefore contractors should work with their subcontractors to ensure all cracks, seams, rough openings, and penetrations in the building envelope are appropriately sealed. See fact sheet on “Preventing Air Leakage”.

RESOURCES

- *Understanding Ventilation* (John Bower), 1995. The Healthy House Institute, Bloomington, IN. Available at 1-800-346-0104.
- *Energy Efficient Florida Home Building* (Florida Solar Energy Center), 1992. Available at 407-638-1000.
- *Canadian Home Builder's Association Builder's Manual*, 1994. Available at 1-800-346-0104.
- *Moisture Control Handbook: Principles and Practices for Residential and Small Commercial Buildings* (Lstiburek and Carmody), 1993. Available at 1-800-346-0104.